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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,006	01/31/2006	Cheng G. Li	61861A	9880
109 7590 05/15/2007 THE DOW CHEMICAL COMPANY INTELLECTUAL PROPERTY SECTION, P. O. BOX 1967 MIDLAND, MI 48641-1967			EXAMINER NGUYEN, TU MINH	
			ART UNIT 3748	PAPER NUMBER
			MAIL DATE 05/15/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/567,006	Applicant(s) LI ET AL.	
	Examiner Tu M. Nguyen	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2007.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
 4a) Of the above claim(s) 10 is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-9 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☒ The drawing(s) filed on 31 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>20060605</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restriction

1. Applicant's election without traverse of the invention of Group I in an Applicant's Response to an Election/Restriction Requirement submitted on May 4, 2007 is acknowledged. Claims 1-9 are readable thereon and will be examined in their full merit. Claim 10 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Molinier et al. (U.S. Patent 7,189,375) in view of Hirota et al. (U.S. Patent 5,974,791) and Moyer et al. (U.S. Patent 5,198,007).**

Re claims 1, 6, and 8, as shown Figures 3-4, Molinier et al. disclose an improved Diesel exhaust filter element (10) of the type having a rigid porous wall portion (12), the porous wall portion having a first side (inlet channel side) and a second side (outlet channel side), such that

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when exhaust gas from a Diesel engine is flowed through the rigid porous wall from the first side to the second side, soot in the exhaust gas is trapped within the rigid porous wall, wherein the improvement comprises the rigid porous wall comprising three layers, the first layer being adjacent the first side of the rigid porous wall, the first layer comprising a Diesel oxidation catalyst (22), the third layer being adjacent the second side of the rigid porous wall, the third layer comprising a three way catalyst (a catalytic metal component of a NO_x adsorber composition (24) is deposited on a washcoat (lines 29-31 of column 8)), the second layer (wall portion (12) and the washcoat) being between the first layer and the third layer, the second layer comprising a nitrogen oxide adsorber (alkali metal or alkaline earth metal (line 65 of column 7 to line 6 of column 8)), such that when exhaust gas from a Diesel engine is flowed through the rigid porous wall from the first side to the second side, the exhaust gas containing excess oxygen (lean of stoichiometry), NO_x and soot, the soot in the exhaust gas is trapped within the rigid porous wall and NO_x is absorbed by the NO_x absorbent, and such that when the exhaust gas is rich of stoichiometry, the NO_x absorbent is regenerated and NO_x is converted into nitrogen gas (lines 6-11 of column 11), and that the second layer (wall portion (12)) comprising a ceramic such as mullite (line 55 of column 6 to line 4 of column 7).

Molinier et al., however, fail to disclose the mechanism of NO_x adsorbing into the NO_x adsorber during a lean engine condition and of NO_x desorbing from the NO_x adsorber during a rich engine condition; and that the ceramic in rigid porous wall is acicular.

As shown in Figure 1, similar to Molinier et al., Hirota et al. disclose an exhaust gas purification device for an internal combustion engine, comprising an integral NO_x absorbent and particulate filter (10a). As indicated on lines 2-43 of column 6, Hirota et al. teach that when an

exhaust gas is lean, the NO in the exhaust gas is catalytically oxidized to NO₂, which NO₂ is then absorbed by the NOx absorbent, and such that when the exhaust gas is rich and contains excess hydrocarbon and carbon monoxide, then the NOx absorbent is regenerated and the remaining hydrocarbon and carbon monoxide are catalytically converted to nitrogen and carbon dioxide. Thus, based on the teaching by Hirota et al. it is at least obvious to one with ordinary skill in the art that in Molinier et al., the NOx in the exhaust gas is adsorbed into the NOx absorbent and is desorbed from the absorbent as claimed.

As shown in Figure 1, Moyer et al. disclose a particulate filter (10) adapted for removing contaminants from a fluid and for use as a carrier of catalysts. As indicated in the Abstract and lines 49-55 of column 2, Moyer et al. teach that it is conventional in the art to form such particulate filter that includes a fused single crystal acicular ceramic support having a discriminating layer thereon, wherein the filter has a network of interlocked needles or platelets which has high mechanical strength, high impact strength, heat resistance, and good resistance to thermal cycling. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the particulate filter taught by Moyer et al. in Molinier et al., since the use thereof would have been routinely practiced by those with ordinary skill in the art to have a filter element having high mechanical strength and good resistance to thermal cycling that is suitable for use in an exhaust gas after-treatment system.

Re claims 2-5, in the modified exhaust filter element of Molinier et al., the NOx absorbent is comprised of a barium salt (line 2 of column 8), the precious metal catalyst is comprised of at least one of platinum, rhodium and palladium (lines 36-43 of column 9), and the acicular ceramic is comprised of acicular mullite.

Re claim 7, in the modified filter element of Molinier et al., the acicular ceramic is acicular mullite, the Diesel oxidation catalyst (22) is comprised of platinum (lines 36-43 of column 9), wherein the nitrogen oxide adsorber is comprised of a barium salt (line 2 of column 8), and wherein the three way catalyst is comprised of one or more of platinum, rhodium or palladium (lines 35-41 of column 7).

Re claim 9, in the modified filter element of Molinier et al., the first layer (22) comprises platinum (lines 36-43 of column 9) and wherein the second layer comprises barium salt (lines 2 of column 8), and at least one of platinum, rhodium or palladium (lines 35-41 of column 7) and wherein the acicular ceramic is acicular mullite.

Prior Art

4. The IDS (PTO-1449) filed on June 5, 2006 has been considered. An initialized copy is attached hereto.
5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of two patents and one patent application: Vance et al. (U.S. Patent 6,803,015), Deeba (U.S. Patent 6,912,847), and Dettling et al. (U.S. Patent Application 2007/0104623) further disclose a state of the art.

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Communication

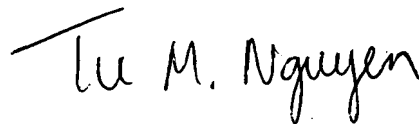
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMN

May 12, 2007



Tu M. Nguyen

Primary Examiner

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